AN ANDROID-BASED KEYBOARD TO MONITOR USER'S ACTIVITIES AND PREDICT SUICIDAL INTENTION TO PREVENT THE UNFORTUNATE EVENT.

THEME

Healthcare

DESCRIPTION

According to the National Survey on Drug Use and Health (US), the cases of serious psychological distress rose by 71% for younger adults (18-25 years) over the period 2008-2017. Similar trends have been noticed among other age groups. Depressive symptoms reports have gone up by 60%, in the last decade, among the adolescents and the young adults. According to Pew's Research Center, over 70% of the young adults have a social media presence. Most people, having a social media presence, tend to write their strong thoughts on the social media. It might be related to political inclination, sports or *suicidal ideation*. Current work has been on predicting suicide ideation based on activities on a particular social media like Twitter or Facebook. These projects have been done on smaller domain, thus restricts the collection of major activities of the user and hence is not quite practical.

Through this project, we are trying to build an android-based keyboard app which monitors what a user types and tries to predict the suicide ideation of the user, irrespective of the platform. Every sentence a user types, is stored in in-mobile database and periodically a suicide ideation score is generated. If the score reaches threshold, then the possible help is sent to the user via a call-to-action notification. For calculating suicide ideation score, we are using a deep-learning model, as described below.

We are trying to extract keywords from a large corpus of suicide posts from suicide-related forums using the TF-IDF method, with the inverse documents being the large corpus of random blog posts. Motivation behind this is to see what types of keywords psychologically distressed people try to use. With these keywords in hand (as search keys), we are trying to extract a corpus of posts from reddit/tumblr. With these annotated data, we are trying to build a deep-learning model, comprising of Word2Vec and LSTM/C-LSTM layers to predict the confidence score. This model is intended for being deployed on the user's mobile as the part of the android app, and thus no data will leave the user's phone protecting privacy. Another advantage of this is that the app will work offline.

Actually, a very small corpus of our text might mean suicide intentions and thus monitoring all texts can be a waste of mobile computing resources. Hence we can use the previously computed keywords to filter out texts and then take the next 5 sentences as well to build a new entry for the database. We will try to explore this improvement as well.

Study Citation:

1. Twenge J, Cooper A, Joiner T, Duffy M, Binau S. Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005-2017.
2. Smith A, Anderson M. Social Media Use in 2018. Pew Research Center: Internet, Science & Tech. http://www.pewinternet.org/2018/03/01/social-media-use-in-2018/. Published March 1, 2018. Accessed July 16, 2018.